

Devices

USSR

UDC: 681.327.76

PEGUYEV, A. N., TRIFONOV, V. V., BUDNIS, M. V. K., LEMZYAKOV, S. R., TARASOV, V. A., SHEREMET'YEV, A. K., Leningrad Electrical Engineering Institute of Communications imeni V. I. Ulyanov (Lenin)

"A Digital Memory Unit"

Moscow, Otkryitiya, izobreteniya, promyshlennyye obraztzy, tovarnyye znaki, No 9, Mar 71, Author's Certificate No 297071, Division G, filed 10 Dec 66, published 2 Mar 71, p 162

Translation: This Author's Certificate introduces: 1. A digital memory unit based on a magnetostriction delay line with cadence pulse generator. As a distinguishing feature of the patent, the effect of variations in ambient temperature is reduced by adding a magnetostriction resonator in the cadence pulse generator made from the same material as the acoustic line in the delay unit. 2. A modification of this memory unit distinguished by the fact that mismatch between the period of the delay line and the cadence pulse period due to nonuniformity in heating of sections of the device is eliminated by utilizing a heater such as the regulating transistor of an electronic voltage stabilizer for the supply system of the device. 3. A modification of this device distinguished by the fact that the range of permissible variations in ambient temperature is extended by adding a system for precisely

1/2

PEGOYEV, A. N. et al., USSR Author's Certificate No 297071

matching the period of the delay line to the cadence pulse period. The actuating element of this system is made in the form of an electronic switch which controls the above-mentioned heater and an acoustic line heater. This latter heater is another controlling transistor in a stabilizer located on the housing of the acoustic line.

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USSR

UDC 621.385.292.8

PEGOYEV, A.N., TRIFONOV, V.V., BUDRIS, M.V., TARASOV, V.M., LEMZYAKOV, S.R.,
SHEREMET'YEV, A.K. [Leningr. elektrotekhn. inst -- Leningrad Electrical Engineer-
ing Institute]

"Source Of High Voltage For Supply Of A Photomultiplier"

USSR Author's Certificate No 266880, filed 8 July 66, published 15 July 70 (from
RZh--Elektronika i yeye primeneniye, No 2, February 1971, Abstract No 2A259P)

Translation: The proposed source of high voltage for supply of a photomultiplier
contains a voltage regulator, the input of the comparison element of which is
connected to the output of the first section of the voltage converter. As the
operating element of the regulator a single-cycle pulse generator with controlled
frequency is used, and as a comparison element for the regulator, a silicon
stabilitron. S.D.

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- 45 -

USSR

UDC 621.396.666

LEN, G. YA.

"Some Characteristic Features of Amplifiers with a New Type Transistorized Automatic Gain Control"

Materialy nauchno-tekhn. konferentsii. Leningr. elektrotekhn. inst. svyazi Vyp. 2 (Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute. Vyp. 2), Leningrad, 1970, pp 180-183 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9027)

Translation: This article contains an investigation of the operation of controlled transistors using the boundary frequency drop with an increase in emitter current. The possibility of realizing automatic gain control with variation of the pass band as applied to aperiodic conditions is demonstrated.

1/1

USSR

UDC 539.2:539.16.04

LENCHENKO, V. M., SAZONOVA, YE. V., and SOFITYENKO, L. A.

"Efficiency of Charged Particle Radiators and Absorbers"

Moscow, Atomnaya Energiya, Vol 29, No 1, Jul 70, pp 33-39

Translation: The energy emitted by radiators or absorbed by charged particle absorbers (α and β particles, Compton electrons and photoelectrons, etc.) is calculated for three configurations of radiators (absorbers): cylindrical (filamentary), film, and spherical. The energy is represented in the form

$$Q = V \int N(\epsilon) K(\epsilon, Z) d\epsilon. \quad (1)$$

Here, V is the volume of the radiator (absorber); $N(\epsilon) d\epsilon$ is the number of charged particles created per unit volume of the radiator (for the absorber, per unit volume of the external emitting medium) in a defined time; ϵ is the initial particle energy; $K(\epsilon, Z)$ is the efficiency of the radiator (absorber), where Z is the set of parameters characterizing the configuration of the radiators (absorbers) and also their stopping power. It is demonstrated that for a radiator, $K(\epsilon, Z)$ depends on ϵ and

1/4

USSR

LENCHENKO, V. M., et al., Atomnaya Energiya, Vol. 29, No. 1,
Jul 70, pp 38-39

Z only in terms of the parameters $x = R_1(E)/d$ and n_1 , and for an absorber it depends also on $R_2(E)$ and n_2 , where $R_1(E) = A_1 \int_0^{\infty} n_1$ is the dependence of the path R on the particle energy in the material of the radiator or absorber (medium 1 is the material of the Bragg-Grey cell) and the surrounding medium (medium 2, the wall material of the Bragg-Grey cell).

From the calculation results it follows that $K_r(E, Z) = K_r(x)$ varies from 0 to 1 with a decrease in the radiator dimensions (d is the diameter of the sphere or filament or the thickness of the film), that is, on varying x from $x = 0$ to $x = \infty$. The effectiveness of the absorbers varies in this case from 0 to a value of

$$K_a(x = \infty) = R_2 n_2 / R_1 n_1 (1 + n_2 - n_1). \quad (2)$$

For the irradiated (absorbed) energy the following limiting values are ob-

tained:

$2/4$

USSR

LENCHENKO, V. M., et al., Atomnaya Energiya, Vol 29, No 1,
Jul 70, pp 38-39

for radiators

$$Q_r(x \ll 1) \approx S \frac{n_1}{4(n_1+1)} \int N_1(\epsilon) R_1(\epsilon) \epsilon d\epsilon; \quad (1)$$

$$Q_r(x \gg 1) = V \int N_1(\epsilon) \epsilon d\epsilon; \quad (4)$$

for absorbers

$$Q_a(x \ll 1) \approx S \frac{n_2}{4(n_2+1)} \int N_2(\epsilon) R_2(\epsilon) \epsilon d\epsilon; \quad (3)$$

$$Q_a(x \gg 1) \approx V \frac{n_2}{n_1(1+n_2+n_1)} \int \frac{R_2(\epsilon)}{R_1(\epsilon)} R_2(\epsilon) \epsilon d\epsilon. \quad (6)$$

This means that for large dimensions of the radiators (absorbers) the energy balance is determined by the interface \$ between the mediums 1 and 2; for small dimensions (less than the particle path length) the energy balance is determined by the volume V

USSR

LENCHENKO, V. M., et al., Atomnaya Energiya, Vol 29,
No 1, Jul 70, pp 38-39

of the radiator or absorber. In intermediate cases with which it is most frequently necessary to deal in practice, this relation is appreciably more complicated. Equation (6) is a generalization of the Bragg-Grey theorem to the case where media 1 and 2 have different stopping powers.

4/6

USSR

UDC 669.2/8

BUMAZHNOV, F. T., and LENCHEV, A. S., Leningrad Mining Institute, Department of Metallurgy of Heavy Nonferrous and Noble Metals

"Sulfating Roasting of Cobalt Sulfide"

Ordzhonikidze, Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, No 2, 1972, pp 26-30

Abstract: The objective of this study was to determine the fundamental physicochemical characteristics of sulfating roasting cobalt sulfide. Included are curves reflecting the degree of CoS and iron desulfurization as a function of temperature and process duration as well as the degree of Co sulfatizing as a function of temperature and process duration with 20 and 10% SO₂ concentrations in the gas phase. Reaction formulas are presented to describe the mechanism of Co sulfatization during sulfating roasting and to show that cobalt sulfatization is a complex multistage process. The ratio of oxidation and sulfatization is governed by the thermodynamic conditions and physicochemical properties of the solid components. The diffusion of the gaseous components through the sulfate layer is hindered, which makes the ion-electron diffusion through the

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USSR

BUMAZHNOV, F. T. and LENCHEV, A. S., Ordzhonikidze, Investiya vysokikh
uchebnykh zavedeniy, Tsvetnaya metallurgiya, No 2, 1972, pp 28-30

sulfate layer, i.e., the migration of both ions and electrons through the
sulfate layer toward the interaction surface, the governing factor.
(3 illustrations, 1 table, 8 bibliographic references)

USSR

UDC 616.981.455.094(479.24)

AKHUNDOV, M. G., LENCHITSKIY, A. Z., EYGELIS, Yu. K., NAMEDZADE, Yu. A.

"Evaluation of the Effectiveness of Antitularemia Measures in Azerbaijan and Problems With Respect to the Prevention of This Disease"

Baku, Azerbaydzhanskiy Meditsinskiy Zhurnal, No 6, 1972, pp 73-78

Abstract: In the Territory of the Azerbaijan SSR there are two active natural foci of tularemia: steppe and high-altitude stream. In some parts of the first of these foci, cases of this disease among humans were noted in 1964-1968. A significant number of preventive measures were undertaken in the republic: shooting rodents -- carriers of the disease -- controlling the disease carriers, general sanitation measures and mass vaccination of the population living in the territory of the natural foci.

The authors evaluate each of the indicated elements on the general level of preventive work and note specific problems for the future. The primary ones among these are the following: continuation of careful epizootological examination and investigation of the acquired material; protection of mass-use water supply; continuation of planned vaccination of the population; training of medical personnel; purposeful analysis of the national economic plans for transformation of nature. All of this will permit timely implementation of the measures aimed at protecting the residents of zones endangered by tularemia.

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USSR

UDC 911.3:616.981.452(479.2)

EYGELIS, Yu. K., ALIYEV, M. N., LENCHITSKIY, A. Z., and MAMIDZADE, U. A.

"Present Structure and History of Natural Plague Foci in Transcaucasia"

V sb. Probl. osobo opasn. infektsiy (Problems of Especially Dangerous Infections -- collection of Works), Saratov, No 4(14), 1970, pp 58-62 (from RZh-Meditsinskaya Geografiya, No 3, Mar 71, Abstract No 3-36.113) by B. Dobrokhotov

Translation: There are at present three autonomous zones in the Transcaucasian territory, which have natural plague foci. In the plain-hoothill part of East Transcaucasia, the focal activity is maintained by red-tailed Libyan jirds, *Xenopsylla conformis* and *Ceratophyllus laeviceps* fleas. In the Armenian highlands on the alpine and subalpine meadows and mountainous plains, the enzootic is usually maintained by the common vole and by the fleas *C. caspius*, *C. consimilis* and *Frontopsylla elata*. In the semiarid zone of Nakhichevan Autonomous ASSR -- Vinogradov's gerbils, *X. conformis* and *C. iramus* fleas. The history of the origin of plague foci in Transcaucasia is described and is linked to the scattering of gerbils from the Iran-Afghanistan desert and to the special features of the course of the epizootic disease in various regions of focal activity. In spite of the common origin of all three natural foci, at present a link between them seems very unlikely.

1/1

- 32 -

USSR

ALIYEV, M. N., EYGELIS, YU. K., and LENCHITSKIY, A. Z.

"Epizootiological Zoning of Natural Plague Foci Located in the Azerbaydzhan SSR"

Baku, Izvestiya Akademii Nauk Azerbaydzhanskoy SSR, Seriya Biologicheskikh Nauk, No 1, 1971, pp 131-135

Abstract: Three natural plague foci are located within the Azerbaydzhan SSR: the focus of the valley-foothill area of Eastern Transcaucasia, the focus in the Transcaucasian mountains, and the focus of the semi-desert area of the Nakhichevan' ASSR. All are shown on a map. The rodent vectors of plague at these three foci are *Meriones erythraurus*, the common vole (*Microtus arvalis*) and Vinogradov's gerbil, respectively. Rodents of other species become infested to some extent with infected fleas and may play a role in epizootics. The regions of the foci consist of a zone in which plague is persistent and surrounding zones in which epizootics are sporadic. In the area of the southeastern inclines of the Minor Caucasus, where the gerbils *Meriones persicus* and *Meriones tristrami* occur, a culture of *P. pestis* was isolated from the carcass of a dead cat and three strains of *P. pestis* of low virulence were isolated from ticks collected from lambs.

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- 43 -

USSR

UDC: 681.3

ZINCHENKO, A. M., LENCHUK, V. S.

"Operator's Panel for Work in a 'Man-Computer' System"

V sb. Primeneniye tsifr. vychisl. mashin dlya obuch. programmir. (Use of Digital Computers for Instruction Programming--collection of works), Kiev, 1970, pp 147-151 (from RZh-Kibernetika, No 7, Jul '71, Abstract No TV698)

[No abstract]

1/2 012 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--SHOWER AMPLIFICATION OF THE CONTRIBUTION OF BRANCHING AND THE
GROWTH OF TOTAL CROSS SECTIONS WHEN E YIELDS TO INFINITY -U-
AUTHOR--(02)-TERMARTIROSYAN, K.A., LENDEL, A.I.

COUNTRY OF INFO--USSR

SOURCE--PIS'MA ZH. EKSP. TEOR. FIZ. 1970, 11(1), 70-5

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--INTEGRAL CROSS SECTION, CASCADE, HIGH ENERGY PARTICLE, PION,
NUCLEON, K MESON, PION PROTON INTERACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0667

STEP NO--UR/0386/70/011/001/0070/0075

CIRC ACCESSION NO--AP0105643

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--16OCT70

2/2 012

CIRC ACCESSION NO--AP0105643

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TOTAL CROSS SECTIONS OF THE PARTICLES P P PRIME PLUS OR MINUS, N , K PRIME PLUS OR MINUS, N AT E YIELDS INFINITY COULD BE EXPLAINED BY SHOWER FORMATION IN THE FORM OF REDISPERSION AND INCREASE OF BRANCHING, WITH PP BRANCHING GIVING THE MAIN CONTRIBUTION. THE THEORETICAL MODELS FOR CASCADE AMPLIFICATION ARE SHOWN. EFFECTS WERE ALSO HYPOTHESIZED OF A CASCADE SCHEME FOR THE GLAUBER CORRECTION OF SECTION DIFFERENCE FOR THE P P AND P P PRIME POSITIVE P PARTICLES.

UNCLASSIFIED

1/2 010 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--DISPERSION SUM RULES FOR PROTON PROTON SCATTERING -U-
AUTHOR--(02)-LENDEL, A.I., LENDEL, V.I.
COUNTRY OF INFO--USSR
SOURCE--YAD. FIZ. 1970, 11(3), 669-72
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--PROTON SCATTERING, REGGE POLE, PROTON SPECTRUM, DISPERSION
EQUATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1991/1068 STEP NO--UR/0367/70/011/003/0569/0672
CIRC ACCESSION NO--AP0110758
UNCLASSIFIED

2/2 010 UNCLASSIFIED PROCESSING DATE--1600170
CIRC ACCESSION NO--AP0110758
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE VALIDITY OF DISPERSION SUM
RULES AT FINITE ENERGIES FOR PP SCATTERING IS DISCUSSED. THESE RULES
ARE VALID AT CONVENTIONAL VALUES OF LOW AND HIGH ENERGY PARAMETERS OF NN
SCATTERING. THE SENSITIVITY OF THE SUM RULES TO THE REGGE POLE
PARAMETERS IS DISCUSSED. FACILITY: UZHGOROD. GDS. UNOV.,
UZHGOROD, USSR.

UNCLASSIFIED

1/2 010 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--DISPERSION SUM RULES FOR PROTON PROTON SCATTERING -U-

AUTHOR--(02)-LENDEL, A.I., LENDEL, V.I.

COUNTRY OF INFO--USSR

SOURCE--YAD. FIZ. 1970, 11(3), 669-72

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PROTON SCATTERING, REGGE POLE, PROTON SPECTRUM, DISPERSION
EQUATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1991/1068

STEP NO--UR/0867/70/011/003/0669/0672

CIRC ACCESSION NO--AP0110758

UNCLASSIFIED

2/2 010

UNCLASSIFIED

PROCESSING DATE--15OCT70

CIRC ACCESSION NO--AP0110758

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE VALIDITY OF DISPERSION SUM RULES AT FINITE ENERGIES FOR PP SCATTERING IS DISCUSSED. THESE RULES ARE VALID AT CONVENTIONAL VALUES OF LOW AND HIGH ENERGY PARAMETERS OF NN SCATTERING. THE SENSITIVITY OF THE SUM RULES TO THE REGGE POLE PARAMETERS IS DISCUSSED. FACILITY: UZHGOROD. GDS. UNOV., UZHGOROD, USSR.

UNCLASSIFIED

UDC

621.396.6-181.5

LEN'DOPREKHO, B. M., NEREN, R. M., KENZHAYEV, V. S.

"Automating the Design Planning of Large Functional Modules"

Izv. Leningr. elektrotekh. in-ta (News of the Leningrad Electrical Engineering Institute), 1971, vyp. 22, pp 37-40 (from Automatizatsiya, No 7, Jul 71, Abstract No 772/6)

Translation: The authors consider the design of large functional modules containing more than 100 simple microcircuits arranged on a commutation substrate and interconnected by at least two layers of connections. A principal difficulty is breaking down the schematic circuit into complexes of microcircuits, arranging them, and making the wiring table-type. A system is described for designing large functional modules with the use of digital computers of the "Minsk-22" type. This system is made up of a number of programs including a program for preliminary breakdown of the circuit, a program for making up sets of substrates for the simple microcircuits, a program for arranging these sets, etc. Bibliography of two titles. R. R.

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USSR

UDC 647.295.94:665.4

MASKAYEV, A. K., MAN'KOVSKAYA, N. K., LEND'YEL, I. V., NEDOROVSKIY, V. T., SIMUROVA, Ye. I., and TEREENT'YEVA, V. N., VNIIPKneftekhim [All-Union Scientific Research, Planning and Design Institute of Petrochemical Processes]

"Production of 12-Hydroxystearic Acid -- Raw Material for Plastic Lubricants"

Moscow, Khimiya i Tekhnologiya Topliv i Masel, No 2, 1971, pp 21-24

Abstract: It has been established that commercial grades of Soviet castor oil contain 4-6 percent fewer glycerides of ricinoleic acid than foreign specimens. Therefore, the production of a high yield of 12-hydroxystearic acid (12-HSA) requires that the hydrogenation process take place under conditions which assure the maximum conversion of ricinoleic acid into 12-HSA. The purpose of the article was to study the effect of castor oil hydrogenation conditions on the process rate, the composition of the hydrogenate and the selection of optimal conditions assuring hydroxy acid conservation. Experiments were conducted in an autoclave with a 5 l. load of castor oil with mechanical stirring (1500 rpm) in the presence of a powdered skeleton metallic catalyst containing 68.8 percent (by weight) nickel. The raw material used was grade I refined castor oil and commercial hydrogen with

1/2

- 67 -

USSR

MASKAYEV, A. K., et al, Khimiya i Tekhnologiya Topliv i Masel, No 2, 1971, pp 21-24

a purity of 99.5 percent by volume. After the catalyst was filtered out, the iodine numbers and fatty acid composition of the samples were determined.

It was found that the conditions assuring maximum (98.5 percent) conversion of ricinoleic acid into 12-HSA are: temperature 130°C, quantity of catalyst at least 2 percent by weight, hydrogen pressure 10-15 atm. In order to conserve hydroxy acids, the castor oil hydrogenation process should not be permitted to go to an iodine number below 5. The Soviet oil and fats industry produces various grades of castor oil differing in purification efficiency. A study of the hydrogenation rate showed that the higher the purification efficiency, the higher the process rate. However, medicinal castor oil cannot be recommended because of its short supply and high cost. The isolation of fatty acids from hydrogenated castor oil presents no difficulties. Using the described technique, VNIIPKneftekhim has for the first time in the USSR organized the pilot production of 12-HSA and new types of 12-HSA-based plastic lubricants possessing high operating properties.

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LENESHKOV, I. M.

Earth Sci.

Yu. V. Vladimirov and A. I. Arshakov. On the question of the origin of lipid in biological membranes. Moscow, 1972, 21 pages, 2000 copies, 1 r 80 k.

Zoogeographic Problem Series (Zoogeographical Problems of Siberia). Collection. Zoological Institute, Siberian Department, Novosibirsk, 1972, 35 pages, 1000 copies, 1 r 60 k.

On the origin of the fish of the Ocean. Collection. Institute of Oceanology named P. I. Sherehov. Moscow, 1972, 281 pages, 1100 copies, 1 r 71 k.

H. F. Lomov and L. N. Lomova. On the question of the origin of the fish of the Ocean. Collection. Institute of Oceanology named P. I. Sherehov. Moscow, 1972, 281 pages, 1100 copies, 1 r 71 k.

On the question of the origin of the fish of the Ocean. Collection. Institute of Oceanology named P. I. Sherehov. Moscow, 1972, 281 pages, 1100 copies, 1 r 71 k.

A. A. Khruta, V. V. Mochalov, and A. K. Chapurov. On the question of the origin of the fish of the Ocean. Collection. Institute of Oceanology named P. I. Sherehov. Moscow, 1972, 281 pages, 1100 copies, 1 r 71 k.

Earth Sciences

On the question of the origin of the fish of the Ocean. Collection. Institute of Oceanology named P. I. Sherehov. Moscow, 1972, 281 pages, 1100 copies, 1 r 71 k.

I. M. Leneshkov and B. V. Rozov. On the question of the origin of the fish of the Ocean. Collection. Institute of Oceanology named P. I. Sherehov. Moscow, 1972, 281 pages, 1100 copies, 1 r 71 k.

A. A. Sunkov, N. Kh. Ardiyev, and V. A. Gerasimov. On the question of the origin of the fish of the Ocean. Collection. Institute of Oceanology named P. I. Sherehov. Moscow, 1972, 281 pages, 1100 copies, 1 r 71 k.

On the question of the origin of the fish of the Ocean. Collection. Institute of Oceanology named P. I. Sherehov. Moscow, 1972, 281 pages, 1100 copies, 1 r 71 k.

1985-57307
20 Oct 70

Biophysics

USSR

UDC 617.574-089.28-07:616.8-
009.6-003.96-01

LENETSKIY, M. L., Candidate of Medical Sciences and ZAKARLNUKA, Ph. D., Kharkov
Institute of Prosthesis, Orthopedics, and Traumatology Invent. Prof. M. I. Sitenko

"Elements of Sensory Compensation in Amputees Fitted with a Bioelectrical
Forearm Prosthesis"

Moscow, Ortopedia, Travmatologiya, i Protezirovaniye, No 5, 1970, pp 14-17

Abstract: Perception of the distance between the thumb and first finger was studied in ten one-handed amputees fitted with a bioelectrical forearm prosthesis with relay control. There were two variations of the experiment: (i) the amputee while blindfolded had to open the prosthesis to a prescribed degree and then duplicate the act with the artificial hand; (ii) he had to open the normal hand to a prescribed degree and do the same thing with the artificial hand. The results showed that there was no statistically significant difference between the amputees and the normal controls with respect to the precision in duplicating the position of the fingers of the natural and artificial hands, whether the act was performed by each hand successively (first variation) or simultaneously (second variation). This precision was possible only when the amputees were aware of the initial position of the fingers.

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USSR

UDC: 577.4

LENEV, I. D.

"Complexity of Realizing Almost all Functions of Logic Algebra
by the Method of Cascades"

Mat. zametki (Mathematics Notes), 1972, 12, No 6, pp 769-780
(from RZh-Kibernetika, No 5, May 73, abstract No SV561 by
V. Orlov)

Translation: An asymptotic estimate is obtained for the com-
plexity of realizing almost all functions of logic algebra by
the method of cascades for switching circuits.

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1/2 007 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--EFFECT OF FERRIC OXIDE ON THE DECOMPOSITION OF CALCIUM AND
MAGNESIUM SULFATES DURING THE ROASTING OF FLUXED PELLETS -U-
AUTHOR-(04)-BORTS, YU.M., KOPYRIN, I.A., FUSAKOV, L.N., LENEV, L.M.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, METAL. 1970, (1), 7-11

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--SULFATE, PELETIZATION, MAGNESIUM COMPOUND, IRON OXIDE, CALCIUM
SULFATE, CALCINATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0168

STEP NO--UR/0370/70/000/001/0001/0011

CIRC ACCESSION NO--AP0054964

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054964

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PELLETS FROM THE MIXTS. FE SUB2 O

SUB3: CASO SUB4 EQUAL 4 AND FE SUB2 O SUB31, MGSD SUB4 EQUAL 4(NY.
RATIO) WERE CALCINED IN AN AIR STREAM. REACTIONS WITH CASO SUB4 AND

MGSD SUB4 STARTED GREATER THAN 1200 AND 1000DEGREES, RESP.

UNCLASSIFIED

ECON

LENEY, O.

FINAL INM OF ASSOCIATION'S DISCUSSION
Article by O. Loney and T. Spence, Moscow, Soviet Union, 24 January 1972,
p. 27

A year has passed since the formation of the Radio Equipment Production Association. What is the form of management planning? What policies regulate production?

We have successfully fulfilled the assignment of the first year of the five-year plan with respect to all indicators. The volume of production, labor productivity, and profits all grew more rapidly than had been anticipated. All this speaks in favor of the creation of the Association although for such a short time the reserves and possibilities for improving its activities have by no means been exhausted.

The structure of the association has been worked out. Separate organizations have been established on relations between its members, and the structure of production in its members has been modified. A specific plan has been indicated for improving specialization and expanding cooperation. We have done much work on the career and on their assignment. In the process we have overcome a certain psychological barrier, especially among the managers who are supposedly "losing" independence.

The creation of a unified party organization for the Association has been of considerable help in the solution of these problems. It played an enormous role in the initiation of a purposeful socialist competition among the shops and sections, joint meetings of the party and industry activists were held. They facilitated the establishment of business-like and concerned relations between the enterprises of the association.

We have already eliminated duplicative production in small sections. Each kind of production effort is now concentrated at one of the enterprises of the association. During this past year, however, we were able to implement only those measures which did not require large capital investments or major reconstructions.

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UDC 621.9.31.669.018.25

REZNIKOV, N. I., BURMISTROV, Ye. V., ZHARKOV, I. G., ZYKIN, A. S., KRAYCHENKO, B. A., LENILIN, V. I., MEDVEDEV, L. P., MITRYAYEV, K. N., URIVSKIY, F. P.

"Cutting of Heat-Resistant, High-Strength Titanium Alloys"

Obrabotka Rezaniyem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov [English Version Above], Moscow, Mashinostroyeniye Press, 1972, 198 pages.

Translation of Foreword: The Twenty-Fourth CPSU Congress defined the main trends in further development of the socialist economy and indicated the necessity of comprehensive acceleration of scientific and technical progress.

One primary trend in the development of the economy is increasing the effectiveness of production. This means that under today's conditions, ever greater significance is being given to increasing the output of products, improving their quality and technical and economic indicators.

Over the past years, the tool industry has solved important problems related to the creation of new tool designs, the development of the production and improvement of tools, as well as mass production of tools of ever stronger high-speed steels. Broad utilization of automated machine tools, continuous and automatic production lines in large-series and mass production requires an increase in the output of cutting tools of long life and

USSR

UDC 621.9.01.669.018.25

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REZNIKOV, N. I., BURMISTROV, Ye. V., et. al., Obrabotka Rezanlyem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov, Moscow, Mashinostroyeniye Press, 1972, 198 pages.

high accuracy, capable of operating under severe cutting conditions for long periods of time without replacement. Tool life can be increased if the tool industry is provided with high quality steels and alloys. Soviet scientists have created alloys with high strength characteristics and high heat resistance. The workability of alloys and steels can be improved by the use of various methods based on ultrasonics, electric contact and induction heating, application of small electric currents to the cutting zone, etc. These methods allow the life of a cutting tool to be increased by 2 to 5 times, increasing the cutting speed and productivity of processing. Part quality can be improved by using tools of natural and synthetic diamonds, as well as elbor.

The present work familiarizes the reader with research conducted into the physics of the cutting process, materials for cutting tools, optimal cutting modes and methods of improving the quality and workability of parts.

TABLE OF CONTENTS

Foreword

4

2/6

- 86 -

USSR

UDC 621.9.01.669.018.25

REZNIKOV, N. I., BURMISTROV, Ye. V., et. al., Obrabotka Rezaniyem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov, Moscow, Mashinostroyeniye Press, 1972, 198 pages.

Workable and Tool Materials	5
Heat-resistant and Scale-resistant Steels and Alloys	5
High Strength Steels and Titanium Alloys	8
Tool Materials	10
Productive Cutting Tools	14
Cutters and Hard Alloy Disk Saws	14
Small Diameter Four-Groove Twist Drills	17
Hard Alloy Reamers for Working Hardened High Strength Steels.	
Reamers for Production of Apertures in Parts of Dissimilar Materials.	23
Taps With Corrected Profile Angle. Effectiveness in Working Hardened Steels, Heat-Resistant and Titanium Alloys	29
Disk Slotted and Cylindrical Milling Cutters for Working of Heat-Resistant and Titanium Alloys	39
Results of Study of Physical Phenomena of Cutting Process	42
Chip Shrinkage and Relative Shear	42
Stress-Strain State with Elementary Chip Formation	50

3/6

USSR

UDC 621.9.01.669.018.25

REZNIKOV, N. I., BURMISTROV, Ye. V., et. al., Obrabotka Rezaniiem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov, Moscow, Mashinostroyeniye Press, 1972, 198 pages.

Deformation, Stress and Cutting Forces	55
Diamond and Elbor Working	62
Turning and Finishing of High Speed and Hard Alloy Tools	62
Electrochemical Diamond Sharpening of Cutting Tools	67
Diamond-Elbor Grinding. Selection of Disks and Determination of Efficient Cutting Modes.	73
Surface Quality, Productivity and Cutting Force in Diamond-Elbor Grinding	76
Residual Stresses in Grinding, Their Influence on Endurance Limit	82
Diamond Smoothing of Parts	87
Usage Properties of Parts Worked by Diamond Smoothing	94
Optimal Cutting Modes	99
Cutting Modes During Working of Parts with Large Dimensions	117
Use of Computers for Determination of Optimal Cutting Modes	121
Quality of Worked Surface and Surface Layer	126
Micro- and Macro-geometry of Worked Surfaces	126
Residual Stresses	128

4/6

- 87 -

5

USSR

UDC 621.9.01.660.018.25

REZNIKOV, N. I., BURMISTROV, Ye. V., et al., Obrabotka Rezaniyem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov, Moscow, Mashinostroyeniya Press, 1972, 198 pages.

Residual Stresses	128
Methods of Determination of Tangential and Axial Residual Stresses	132
Regulation of Sign and Magnitude of Residual Stresses	139
Influence of Residual Stresses on Endurance Limit	143
Formation of Surface Layer of Parts with Ultrasonic Hardening	146
	153
Effectiveness of Ultrasonic Oscillations During Cutting of Threads with Taps	153
Electric Contact Heating During Turning and Cutting of Bars and Ingots of Titanium Alloys	158
Effectiveness of Weak Electrical Current During Drilling	162
Workability and its Relationship to Rigidity and Vibration	
Stability of the Elastic MDTP System	168
Relationship of Accuracy and Productivity of Metal-Cutting Machine Tools and their Rigidity	168
Contact Rigidity	175
Apparatus and Method of Studying Dynamics of Cutting and Vibration	182

5/6

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USSR

UDC 621.9.01.660.018.25

REZNIKOV, N. I., BURMISTROV, Ye. V., et al., Obrabotka Rezanymi Zharoprochnyykh Vysokoprochnyykh i Titanovyykh Splavov, Moscow, Mashinostroyeniya Press, 1972, 198 pages.

Tool Life and Surface Quality as Functions of Vibration Intensity	187
Influence of Cutting Parameters on Vibration Intensity	190
Bibliography	194

USSR

UDC 519.21

LENIN, A. I.

"Generalization of Limit Theorem of Baxter For a Planar Random Field with Gaussian Increments"

Avtomatiz. Nauchn. Issled. Morey i Okenov. Ch. 1, [Automation of Scientific Studies of the Seas and Oceans, Part 1--Collection of Works], Sevastopol', 1970, pp 271-276, (Translated from Referativnyy Zhurnal Kibernetika, No. 5, 1971, Abstract No. SV122 by V. Alekseyev).

Translation: A theorem similar to the theorem of "near certain" properties is proven for a random field $(x(t, s); 0 \leq t, s \leq 1)$ with Gaussian increments.

USSR

UDC 51:621.391

LENIN, A. I.

"Calculation of Probability of False Solution of the Linear System of Boolean Equations with Random Right Parts"

Avtomatiz. Nauchn. Issled. Morey i Okeanov. Ch. 1. [Automation of Scientific Investigations of the Seas and Oceans, Part 1 -- Collection of Works], Sevastopol', 1970, pp 277-288 (Translated from Referativnyy Zhurnal Kibernetika, No 3, 1971, Abstract No 3 V317).

Translation: A system of linear Boolean equations with random right parts is studied. In order to find the solution of the system, the Bayes rule is applied and the probability of false solution is determined. Asymptotic formulas are indicated for the lower and upper limits of this probability. It is noted that one particular application of the results of this article is analysis of the probability of false decoding of redundant codes during decoding with noise.

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USSR

UDC 51

ZAK, YU. A., ~~LENIN, A. P.~~, FISHBEYN, M. A.

"Algorithms for Calculating the Technological Component Cost of Various Types of Finished Production and Intermediate Products of Complex Production Complexes"

V sb. Prom. kibernetika (Industrial Cybernetics -- Collection of Works), Kiev, 1971, pp 205-212 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V541)

No abstract

1/1

- 51 -

Entomology

UDC 611.89-086-019:577.153.9

USSR

RAKITIN, A. A., Biophysics Laboratory, Institute of Plant Protection, All-Union Academy of Agricultural Sciences imeni V. I. Lenin, Leningrad

"Nature of the Distribution of Cholinesterase Activity in Ganglia of the Insect Central Nervous System Under Normal Conditions and After Inhibition by Insecticides"

Leningrad, Arkhiv Anatomii, Gistologii i Embriologii, Vol 39, No 9, Sep 70, pp 63-69

Abstract: Photometry was used to study the distribution of cholinesterase activity in the mesothoracic ganglia of the Asian locust (*Locusta migratoria*) and caterpillar of the turnip moth (*Agrotis segetum*). Four zones of accumulation of the enzyme were detected in the locust: (I) periphery of the neuropil, 95% of the activity; (II) intermediate between zone I and zone III, 28% less activity than zone I; (III) connective fibers, 10% less activity than zone I; (IV) center of the neuropil, 52% less activity than zone I. Two zones of cholinesterase activity were found in turnip moth caterpillar ganglia, the first corresponding to the periphery of the neuropil and the second, to the center. Enzymatic activity in the first zone was 1-3% higher than in the second. Cholinesterase inhibitors

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USSR

RAKITIN, A. A., et al, Arkhiv Anatomii, Gistologii i Embriologii, Vol 59, No 9, Sep 70, pp 63-69

(alpha and beta isomers of sevin, and two organophosphorus compounds) varied in the degree of inhibition exerted. In low concentrations, they all inhibited cholinesterase activity more in the central zones than in the periphery.

2/2

1/2 008 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--FORMATION OF COMPOUNDS OF AROMATIC, THIOPHENE, AND DIENE SERIES
DURING THE PYROLYSIS OF COAL AND VAPOR GAS PYROLYSIS PRODUCTS -U-
AUTHOR--(04)--MARIICH, L.I., GANZHA, L.M., LENKEVICH, Z.H.K., SHCHERBAN, I.P.

COUNTRY OF INFO--USSR

SOURCE--KHIM. TVERD. TOPL. 1970, (3), 127-31

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--DIENE, THIOPHENE, PYROLYSIS, COAL, BENZENE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--3008/0865

STEP NO--UR/0467/70/000/003/0127/0131

CIRC ACCESSION NO--AP0137893

UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0137893

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. PYROLYSIS OF COAL WAS DONE IN A LAB. TUBULAR FURNACE CONSISTING OF 2 SECTIONS, THE FIRST FOR COKING AT 25-800DEGREES, AND THE SECOND FOR PYROLYSIS OF GASEOUS PRODUCTS FROM THE 1ST SECTION. THE MAIN FACTOR DETG. THE QUANT. COMPN. OF THE PRODUCTS WAS THE TEMP. OF PYROLYSIS OF THE GASES. WITH INCREASED TEMP., THE BENZENE AND THIOPHENE IN THE TOTAL GAS INCREASED. THE CONTENTS OF CYCLOPENTADIENE, AND THE METHYL DERIV. OF BENZENE AND THIOPHENE PASSED THROUGH A MAX. WITH TEMP. FACILITY: UKR. UGLEKHIM. INST.,

KHARKOV, USSR.

UNCLASSIFIED

USSR

UDC 621.385:530.145.6:621.317.17

KORONKEVICH, V. P., LENKOVA, G. A.

"A Laser Interferometer for Length Measurement"

Avtometriya (Autometry), 1971, No 1, pp 4-9 (from RZh-Radiotekhnika, No 11, Nov 71, Abstract No 11D554)

Translation: With the development of lasers, it has become possible to use interference methods of length measurement in industrial applications. A laser interferometer has been developed in the Institute of Automation and Electrometry, Siberian Department, Academy of Sciences of the USSR which can be used as a device for measuring displacements. A helium-neon laser stabilized on the Lamb minimum is used as the light source. The operating principle of the laser interferometer is considered as well as a method of introducing corrections for atmospheric conditions. The index of refraction of air and wavelength under normal conditions are calculated for helium-neon lasers, and a formula is given for introducing corrections. Test results are presented for a laser interferometer used under laboratory and industrial conditions.

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= 32 =

USSR

UDC 612.89

YAKOVLEV, N. N., KRASNOVA, A. F., ~~LENKOVA~~, R. I., and MAXIMOVA, L. V.,
Leningrad Institute of Physical Culture

"Effect of Sympatholytin on Metabolism in Resting and Working Muscles in
Relation to the Degree of Their Adaptation to Increased Activity"

Leningrad, Fiziologicheskii Zhurnal SSSR, No 4, 1973, pp 584-589

Abstract: In rats systematic exercise (swimming) increased muscle glycogen, creatine phosphate, cytochrome oxidase activity and intensity of respiration and phosphorylation in muscle cell mitochondria, especially in the first month of training. Injection of 10 mg/kg of sympatholytin [N-(2-chloroethyl) dibenzylamine hydrochloride] had no effect of glycogen, creatine phosphate, and creatine kinase activity in resting muscles, but reduced the intensity of cytochrome oxidase and mitochondrial respiration and phosphorylation. During the first month of adaptation to increased activity, sympatholytin caused greater disruption of the oxidative processes in trained animals than in the controls. However, the disturbances diminished considerably by the end of the third month of adaptation. The experimental results show that energy metabolism in muscles (both working and resting) is controlled by the sympathetic nervous system and that the degree of control steadily diminishes in the course of adaptation to increased activity.

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USSR

UDC 612.766.1+577.105

LENKOVA, R. I., USIK, S. V., and YAKOVLEV, N. N., Sector of Biochemistry,
Leningrad Scientific Research Institute of Physical Culture, Leningrad

"Changes in the Urea Content in the Blood and Tissues in Relation to the
Adaptation of the Organism"

Leningrad, Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenova, Vol 59,
No 7, Jul 73, pp 1,097-1,101

Abstract: The content of urea in the blood, liver, and muscles during rest was the same for rats trained by swimming in water at 20-32° as for untrained animals. However, the increase in the content of urea following muscular effort resulting in fatigue was smaller for trained than untrained animals, while the restoration of the normal content of this substance was faster. Intraperitoneal administration of sympatholytic increased the level of urea both at rest and during muscular effort. This effect was less pronounced for trained than untrained animals. The effect of sympatholytic was associated with its action in reducing ATP formation.

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- 46 -

USSR

UDC 612.744.2

YAKOVLEVA, N. N., KRASNOVA, A. F., LENKOVA, R. I., SAMOMANOVA, G. I., and CHAGOVETS, N. R., Biochemistry Sector, Leningrad Research Institute of Physical Culture

"Restoration After Muscular Activity Under Different Temperature Conditions"

Leningrad, Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenova, No 4, 1971, pp 556-561

Abstract: Fifteen minutes swimming in water at 32°C produced in rats previously trained (3 months) for this activity a more economical consumption of glycogen, creatine phosphate, and mitochondrial protein, smaller increase in blood and muscle lactate and blood sugar levels, and less intense enzymic activity compared with untrained controls. Moreover, the biochemical changes occurring in the rest period were indistinct or absent (e.g., no supercompensation of glycogen and creatine phosphate content, hypolactacidemia, decrease in cytochrome oxidase activity) in the trained animals. On the other hand, swimming in water at 22° produced far greater biochemical changes in the muscles of the trained rats than swimming in water at an optimum temperature (32°) did in the untrained animals. And during the recovery period the trained rats

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USSR

YAKOVELVA, N. N., et al., Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenova, No 4, 1971, pp 556-561

exhibited marked supercompensation of the glycogen content of the muscles, mitochondrial protein, and creatine phosphate, distinct hypolactacidemia, decrease in muscle lactic acid below the original level, and increased activity of the redox enzymes.

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1/2 027 UNCLASSIFIED PROCESSING DATE--11DEC70
TITLE--DIAGNOSING INFECTIOUS ENTEROTOXEMIA WITH TYPE SPECIFIC SERA -U-
AUTHOR-(02)-LENKOVA, V.A., LARKHO, T.YE.
COUNTRY OF INFO--USSR
SOURCE--VETERINARIYA, 1970, NR 5, PP 107-108
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--CLOSTRIDIUM PERFRINGENS, BACTERIAL TOXIN, DIAGNOSTIC METHODS,
WHITE MOUSE, BLOOD SERUM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605049/E01 STEP NO--UR/0346/70/000/005/0107/0108
CIRC ACCESSION NO--AP0143392
UNCLASSIFIED

2/2 027

UNCLASSIFIED

PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AP0143382

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RAPID DIAGNOSIS OF INFECTIOUS ENTEROTOXEMIA AMONG SHEEP CAN BE ACCOMPLISHED BY TYPING TOXINS FOUND IN THE STOMACH CONTENTS OF FECES, WITHOUT BACTERIOLOGICAL STUDY. HIGHLY ACTIVE AND SPECIFIC SERA TO CL. PERFRINGENS TYPES A, B, C, D, E AND F HAVE BEEN USED FOR THIS PURPOSE SINCE 1957. PATHOLOGICAL MATERIAL IS DILUTED, INCUBATED FOR ONE HOUR, FILTERED OR CENTRIFUGED, MIXED WITH TYPE SERA, INCUBATED AT 37-38 C, AND INJECTED INTO WHITE MICE. THE TOXIN TYPE IS DETERMINED BY THE VIABILITY OF MICE. ANTITOXIC TYPE D SERUM NEUTRALIZES ONLY TYPE D TOXIN, WHILE C AND B SERA CROSS NEUTRALIZE BOTH C AND B TOXINS. RESULTS OF TYPING INTESTINAL TOXINS AND ISOLATED CULTURES COINCIDED IN ALL CASES. FACILITY:
YUZHNO-KAZAKHSTANSKAYA NAUCHNO-ISSLEDOVATELSKIY INSTITUT,
YUZHNO-KAZAKHSTAN SCIENTIFIC RESEARCH INSTITUTE OF VETERINARY
SANITATION.

UNCLASSIFIED

1/2 015
UNCLASSIFIED
TITLE--EFFECT OF THE VITAL ACTIVITY PRODUCTS OF ACCOMPANYING BACTERIA ON
THE GROWTH OF SOME CHLORELLA STRAINS -U-
AUTHOR--(031)-LENOVA, L.I., SHEVCHENKO, N.S., ZHAROVA, L.H.
COUNTRY OF INFO--USSR
SOURCE--MIKROBIOL ZH (KYYIV) 32(1): 111-115, 1970
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--CHLORELLA, BACTERIA, PLANT GROWTH REGULATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605001/FOI STEP NO--UR/0438/70/032/001/0111/0115
CIRC ACCESSION NO--AP0139387
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--0-DEC 70

CIRC ACCESSION NO--AP0139387

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF 417 STRAINS OF BACTERIA ON CHLORELLA VULGARIS WAS INVESTIGATED. MOST OF THE BACTERIA DO NOT AFFECT THE GROWTH OF ALGAE. A SMALLER AMOUNT OF THE ACCOMPANYING BACTERIA (24-27-40PERCENT) EXCRETE STIMULATING SUBSTANCES. A NEGLIGIBLE AMOUNT OF THE ACCOMPANYING BACTERIA (0-3-9PERCENT) EXCRETE SUBSTANCES INHIBITING THE GROWTH OF THE ALGAE. FACILITY: INST. MICROBIOL. VIROL., ACAD. SCI. UKR. SSR, KIEV, USSR.

UNCLASSIFIED

USSR

UDC 577.17:576.8+582.23

LENOVA, I. Y., SHEVCHENKO, N. S., and ZHAROVA, L. H., Institute of Microbiology and Virology, Academy of Sciences, Ukrainian SSR

"Effect of the Products of Life Processes of Accompanying Bacteria on the Growth of Some *Chlorella* Strains"

Kiev, Mikrobiologicheskyy Zhurnal, Vol 32, No 1, Jan/Feb 70, pp 111-115

Abstract: The effect of 417 associated strains of bacteria on *Chlorella vulgaris* strains 62, 9 and PPG was investigated. Most of the associated bacteria had no effect on algae growth. Some strains had a stimulating effect 24%, 27% and 40% with respect to strains 62, 9 and PPG and some an inhibiting effect none, 3% and 5% respectively. The most active stimulators of algae are: *Bacterium candicans*, *Bact. nitrificans*, *Bact. centro-sporus*, *Micrococcus luteus*, *Pseudomonas liquefaciens*, *Ps. sinuosa*, *Ps. virescens*, *Sarcina schellera*, *Sarcina lutea*, *Bacillus natans*, and *Chromobacterium aurantiacum*. *Bacterium candicans* and *Bact. nitrificans* were also the strongest bacterial antagonists. It was noted that some bacteria are capable of undergoing laboratory mutation, so that some stimulators lose their property, and the antagonists may even begin to stimulate growth.

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- 32 -

Welding

USSR

UDC 621.791.01.001.5:669.245

PERFIL'YEV, A. N., Engineer, SIDLIN, Z. A., Engineer, LEMISHIN, YU. T., Engineer

"Study With the Application of the Method of Experimental Planning of the Properties of the Weld Metal When Welding Nickel Alloy"

Moscow, Svarochnoye proizvodstvo, No 9, 1972, pp 1-4

Abstract: The method of experimental planning was used to study the properties of low-carbon nickel-chromium-molybdenum weld metal and obtain a mathematical description of the properties of the weld metal in the investigated range of compounds: Cr = 16.7-26.7%, Si = 0.3-0.93%, Fe = 1.17-2.38%. The effect of the content of the investigated elements (each separately and on interaction of them) on the properties of the weld metal was estimated by analyzing the regression equations obtained. Increasing the chromium content in the weld metal compensates for the negative effect of the silicon and iron. The admissible content of the silicon and iron increases appreciably in comparison with the base metal. The range of compositions of the weld metal having the optimal set of properties was defined as Cr = 19.2-21.7%, Si $\leq$ 0.3% and Fe $\leq$ 1.17%.

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LENSKAYA, G. N.

5 PRS 55.3.11
6 N 1200 1/2

UDC: 611.73:611.1-019:612.014.47

AGE-RELATED CHANGES IN VASCULARIZATION OF THE RAT'S SKELETAL MUSCLES AS RELATED TO NATURE OF EXERCISE

[Article by G.N. Lenskaya, Chair of Anatomy and Biomechanics (headed by Ye. I. Tsareva, Candidate of Biological Sciences), Kazakh Institute of Physical Culture, Alma Ata; Leningrad, All-Union Anatomical, Cytological and Embryological Institute, No 11, 1971, submitted 26 February 1971, pp 115-120]

Under the influence of regular training not only do functional adaptations of skeletal muscles occur, but also their structure undergoes substantial reorganization leading to development of a qualitatively different type of organization leading to increased activity (A.A. Kravskaya, 1923; I.I. Pavlov, 1955; T.N. Vidik, 1957; K.G. Shchitkov, 1957; E.S. Lopyntsev, 1960; G.ova, 1955; T.N. Vidik, 1957; K.G. Shchitkov, 1957; E.S. Lopyntsev, 1960; S.S. Tajik, 1967; P.Z. Gur, 1967; G.S. Kasyrov, 1967; P.Z. Guds' and A.D. Kavruta, 1968; Ye.S. Yakovleva, 1968, and others).

At the same time, the question of change in blood supply to skeletal muscles as related to varying intensities of exercise has been investigated less (Vernotti and Nagday, 1934; Sjostrom, 1935; K.S. Lopyntsev, 1957; P.Z. Gur, 1968).

In the literature accessible to us we failed to find data about changes in vascularization of skeletal muscles under the effect of exercise at different ages. The present work deals with this subject.

Material and Methods

Animals were divided into three series: control (22), animals subjected to moderate loads (22), and animals subjected to increased loads (22). In each of these series, the animals were grouped according to age (with 5-10 in each group). In the control group, 11 were young rats (6-7 months old) and 11 were old rats (12-14 months old). In all we had 66 rats under observation. The experimental series of animals was submitted to experimental training in the form of swimming, and we applied the principles, well known in athletics, of gradual increase, repetition, and inclusion of maximum loads. For the animals who were exposed to moderate loads, training began for one

USSR

SOLODOVNIKOV, V. V., LENSKIY, V. L.

"Correctness, Regularization and Principle of Minimum Complexity in the Statistical Dynamics of Automatic Control Systems"

Tr. IV Vses. Soveshch. po Avtomat. upr., 1968. Teoriya Avtomat. upr. [Works of Fourth All-Union Conference on Automatic Control, 1968. The Theory of Automatic Control], Moscow, Nauka Press, 1972, pp 140-170, Discussion 256-262 (Translated from Referativnyy Zhurnal, Kibernetika, No 3, Moscow, 1973, Abstract No 3 V279 by the authors).

Translation: In order to produce stable algorithms for the solution of problems in statistical dynamics, it is expedient to use methods of regularization of incorrect problems, developed by A. N. Tikhonov. This report demonstrates that with proper selection of the functional being regularized, this type of approach to solution of the problem of synthesis allows production not only of correct algorithms, but of a system of minimum complexity. The concept and principles of minimum and limited complexity are formulated.

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UDC 539.3

USSR

BROVKO, G. L., LENSKIY, V. S., Moscow

"On the Convergence of the Method of Homogeneous Linear Approximations in Problems of the Theory of the Elasticity of Nonhomogeneous Bodies"

Moscow, Prikladnaya Matematika i Mekhanika, No 3, May/Jun 72, pp 519-527

Abstract: The problem of equilibrium is formulated mathematically for a deformable solid whose elastic and plastic characteristics are functions of the coordinates. The elimination of nonlinear terms and terms accounting for the deviation of the elastic moduli from certain constant values leads to the method of linear consecutive approximations, which is similar to the method of elastic solutions. In each approximation a problem of linear elasticity theory is solved for a homogeneous body acted on by imaginary mass and surface forces determined by the previous approximation. The convergence of the method as applied to the first and second boundary value problems is proved through the use of functional analysis. It is noted that bodies and media are in many cases nonhomogeneous with respect to mechanical properties and that such nonhomogeneity arises either during the formation of the material such as hardening from the melt, tempering, aging, etc. or is the result of the presence of nonhomogeneous temperature fields.

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BROVKO, G. I., LENSKIY, V. S., Prikladnaya Matematika i Mekhanika, No 3,
May/Jun 72, pp 519-527

radioactive irradiation, and other physical and chemical fields. The elastic and plastic characteristics of the material are then functions of the coordinates which are represented either in explicit form, in the case of naturally nonhomogeneous media, or are introduced with the aid of field functions, in the case of an irradiation dose or the degree of austenite transformation in the tempering of steel.

2/2

- 64 -

1/2 015
UNCLASSIFIED
PROCESSING DATE--090670
TITLE--CORRELATION BETWEEN THE ANTIGENIC PROPERTIES AND THE SENSITIVITY OF
ENTEROPATHOGENIC E. COLI TO BACTERIOPHAGES AND COLICINES -N-
AUTHOR--1031-BORISOV, L.B., LENTS, E.K., KLIMASHEVSKAYA, V.F.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGI I IMMUNOBIOLOGII, 1970, NR 3,
PP 71-76
DATE PUBLISHED--70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--ESCHERICHIA COLI, BACTERIOPHAGE, AGGLOUTINATION, ANTIGEN
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1990/1461
STEP NO--UR/0016/70/000/003/0071/0076
CIRC ACCESSION NO--AP0109521
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--09OCT70

2/2 015

CIRC ACCESSION NO--AP0109521

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE AUTHORS PRESENT EXPERIMENTAL DATA INDICATING THAT BACTERIOPHAGE RESISTANT SUBCULTURES ISOLATED FROM BACTERIOPHAGE SENSITIVE E. COLI O26:B6 STRAINS FAILED TO AGGLOUTINATE WITH SPECIFIC OB SERA AND POSSESSED A WIDER SPECTRUM OF SENSITIVITY TO VARIOUS TYPES OF COLICINES THAN BACTERIOPHAGE SENSITIVE AND AGGLOUTINABLE FORMS OF THE SAME BACTERIA. THE MAJORITY OF BACTERIOPHAGE RESISTANT SUBCULTURES ISOLATED FROM BACTERIOPHAGE SENSITIVE E. COLI O111:B4 STRAINS FAILED TO CHANGE THEIR OB ANTIGENS, BUT BECAME RESISTANT TO MANY TYPES OF COLICINES, TO WHICH BACTERIOPHAGE SENSITIVE CULTURES WERE SENSITIVE. IN THE AUTHORS' OPINION THE SAME OR CLOSELY CONNECTED RECEPTORS REALIZE THE BACTERIOPHAGE RECEPTOR AND ANTIGENIC FUNCTION IN E. COLI O26:B6 CULTURES. OB ANTIGENS AND RECEPTORS TO COLICINES IN THESE BACTERIA ARE MORE DIFFERENTIATED THAN IN E. COLI O111:B4. BACTERIOPHAGE RECEPTOR AND ANTIGENIC FUNCTION IN THE LATTER BACTERIA ARE SEPARATED, AND POSSIBLY, THEIR RECEPTOR APPARATUS TO BACTERIOPHAGE AND COLICINES IS LESS DIFFERENTIATED. COLICINOGENIC PROPERTIES OF THE CULTURES UNDER STUDY WERE INDEPENDENT OF THEIR SENSITIVITY TO BACTERIOPHAGES AND OF OB ANTIGENS.

UNCLASSIFIED

UDC 621.375.826

USSR

PFAYFFER, H., VERNE, V., LAU, A., VAYGHAN, M. I., LENTS, K., GADOV, P.

"Procedure for Separating the Weak Lines of Forced Combination Scattering by Means of Selective Absorption on the Frequency of the Strongest Stokes Component"

V sb. Kvant. elektronika (Quantum Electronics--collection of works), Moscow, No 5, 1971, pp 129-131 (from RZh-Radiotekhnika, No 1, 1972, Abstract No 10342)

Translation: In the presence of forced combination scattering, usually only the combination scattering component with the largest amplification coefficient appears in the spectrum. Its appearance causes such strong depletion of the intensity of the exciting laser that the other combination scattering signals cannot grow to the sensitivity threshold of the receiver. By selective absorption for the predominant Stokes component it is possible to facilitate the appearance of other combination scattering frequencies. It was theoretically demonstrated that when using an absorbing liquid for which the ratio of the absorption coefficient on the frequency of the first Stokes component and on the laser frequency of 100:1 is obtained, the detection threshold of the weak component can be reduced by 7 times. The bibliography has 3 entries.

1/1

1/2 012 UNCLASSIFIED
TITLE--APPARATUS FOR SUPERIMPOSING TRIANGULAR VOLTAGE PULSES ON A DROPPING
MERCURY ELECTRODE AT A GIVEN MOMENT OF DROP LIFE -U-
AUTHOR-(05)-LENTSNER, B.I., KHOPIN, A.M., KNOTS, L.L., TSVENTSASHVILI,
V.SH., ZHDANOV, S.I.
COUNTRY OF INFO--USSR
SOURCE--ELEKTROKHIMIYA 1970, 6(1), 29-34
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--DROPPING MERCURY, THALLIUM, CADMIUM, ION, ELECTROLYTIC
REDUCTION, BENZALDEHYDE, POLAROGRAPHIC ANALYZER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1984/1815

STEP NO--UR/0364/70/006/001/0029/0034

CIRC ACCESSION NO--AP0100389

UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--18SEPTO

CIRC ACCESSION NO--AP0100389
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE APP., BASED ON THE
POTENTIOSTAT, WAS TESTED BY USING A STD. SOLN. CONTG. TL PRIME POSITIVE
AND CD PRIME2 POSITIVE AND FOR THE STUDY OF A NO. OF COMPOS. THE REDN.
OF BENZALDEHYDE ON THE DROPPING MERCURY ELECTRODES WAS STUDIED IN A N
HCL0 SUB4 ALC. SOLN. THE ABSENCE OF ANODE PEAKS CORRESPONDING TO OXIDN.
OF THE RADICALS TO THE INITIAL SUBSTANCE ON THE CYCLIC POLAROGRAMS IS
ATTRIBUTED TO THE STAGE SUBSEQUENT TO THE ELECTRODE PROCESS PROCEEDING
VERY RAPIDLY AND THE OXIDN. CURRENT OF THE INTERMEDIATE PRODUCT NOT
REGISTERING PRIOR TO RATES OF APPLICATION OF THE POTENTIAL IN THE GROEP
OF 100 V-SEC.

UNCLASSIFIED

UDC: 669.14.018.252.3:629.789

USSR

LOKSHIN, L. F., KUPALOVA, I. K., LENYASHIN, V. B.

"News in the Technology of the Thermomechanical Treatment of High Speed Steels

Metallovedeniye i Termicheskaya Obrabotka Metallov, No 9, 1973, pp 31-34.

Abstract: This work describes a study of the influence of low and high temperature heat treatment and mechanical working modes on the strength, ductility, red hardness and cutting ability of drills, as well as the fine structure and physical properties of high speed steels of three groups: tungsten steels (R12 and R18), tungsten-molybdenum steels (R6, R15) and tungsten-molybdenum-cobalt steels (R6MSK5). All steels were subjected to low temperature treatment with deformation at 550-600° C. In addition types R6MS and R6MSK5 steels were subjected to high temperature treatment with deformation at 1000-1100° C. The strength and ductility were found to increase with increasing deformation, maximum values of strength and ductility corresponding. The study of the fine structure showed that defects formed during deformation of austenite at 1000-1100° C, significantly increasing the diffusion mobility of the carbon in the austenite, cause the formation of tiny alloy carbides immediately during deformation or during cooling after deformation. The results produced allow heat and mechanical treatment to be

1/2

USSR

Lokshin, L. F., Kupalova, I. K., Lenyashin, V. D., Metallovedeniye i
Termicheskaya Obrabotka Metallov, No 9, 1973, pp 31-34.

recommended for high speed steels, particular high temperature heat and
mechanical treatment for R6M5 steel.

2/2

- 53 -

USSR

UDC [537.226+537.311.33]:[537+535]

VALATSKA, K. K., DAVIDENENE, D. K., KNISEVSKIY, K. M., and LECIUS, P. I.

"Investigation of Photoeffect in Germanium and Silicon Under Photoreflex Conditions"

Lit. fiz. sb. (Collection of Lithuanian Works on Physics), 1971, 11, No 2, pp 269-275 (summaries in Lithuanian and English) (from Rzh-Pizika, No 10, Oct 71, Abstract No 10YE790 by authors)

Translation: The authors investigated the intrinsic photoeffect in Ge and Si under photoreflex conditions. Theoretical calculations are given of spectral characteristics of the photoreflex signal for specimens of varying thickness with varying surface treatment, as well as a comparison of these calculations with experimental results.

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- 63 -

Controls

UDC 62.503.53

USSR

LEONAVICHENE, Ya. K., KEMESHIS, P. P.

"A Two-Channel Tracking System With Amplidynes"

Vil'nyus, Nauchnyye trudy vysshikh uchebnykh zavedeniy Lit. SSR. Avtomatika i vychislitel'naya tekhnika (Scientific Works of Institutions of Higher Education of the Lithuanian SSR. Automation and Computer Technology), No 2, 1970, "Mintis", pp 25-30

Abstract: In this article, the authors consider a two-dimensional tracking system with amplidynes and modulators in the feedback circuits. Equations are given for the output coordinates, and relationships are defined for the parameters in the static mode of operation of the system. Two illustrations, bibliography of three titles.

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INTERNAT. AEROSPACE ABST. ^{3/10} 4120000

A70-17071 #

EXPERIMENTAL PROCEDURES FOR STUDYING THE ENDURANCE LIMIT OF REFRACTORY METALS AND ALLOYS AT TEMPERATURES UP TO 2000°K (METODIKA ISSLEDUVANIYA VYNOSLIVOSTI TUGOPLAVKIKH METALLOV I SPLAVOV PRI TEMPERATURE DO 2000°K).

V. T. Troshchenko, B. A. Gрязнов, V. A. Roykov, and G. K.

~~Levchenko~~

IN: THERMAL STABILITY OF MATERIALS AND STRUCTURAL ELEMENTS; AKADEMIIA NAUK UKRAINSKOI SSR, INSTITUT PROBLEM PROCHNOSTI, ALL-UNION SCIENTIFIC-TECHNICAL

CONFERENCE, 5TH, KIEV, UKRAINIAN SSR, DECEMBER 1967

TRANSACTIONS, NUMBER 5 (TERMOPROCHNOST' MA

TERIALOV I KONSTRUKTIVNYKH ELEMENTOV; AKADEMIIA

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AT0028953

NAUK UKRAINSKOI SSR, INSTITUT PROBLEM PROCHINOSTI,
VSESOUZNOE NAUCHNO-TEKHNIЧЕСKOE SOVESICHANIE,
5TH, KIEV, UKRAINIAN SSR, DECEMBER 1987, MATERIALS,
NUMBER 5). (A70-17026 05-32)

Edited by G. S. Pisarenko.

Kiev, Izdatel'stvo Naukova Dumka, 1989, p. 395-402. In Russian.

Description of several facilities designed for studying the
stress-rupture strength of structural elements made from refractory
metals, in vacuum and inert gas atmospheres. Experimental data
concerning the influence of the temperature and medium (air and a
vacuum of .00001 mm Hg) on the endurance limit of niobium alloys
are examined.

V.P. *Sw*

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1/2 030
UNCLASSIFIED
TITLE--HEAT TRANSFER CRISIS DURING BOILING WITH SUBCOOLED WATER MOVING IN
PIPES AT HIGH SPEEDS AND AT LOW PRESSURE -U-
AUTHOR--(03)-SHLYKOV, YU.P., LEONGARDT, A.D., POTAPOV, A.P.
COUNTRY OF INFO--USSR
SOURCE--TEPLOENERGETIKA 1970, 17(3), 63-5
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--BOILING, HEAT TRANSFER RATE, STAINLESS STEEL TUBE, WATER, FLOW
VELOCITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAHE--1989/1054
STEP NO--UR/0096/70/017/003/0063/0065
CIBI ACCESSION NO--AP0107563
UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0107563

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CRIT. HEAT FLOW (Q SUBCR) EXPTS. WERE CONDUCTED IN 3.6-MM INSIDE DIAM., STAINLESS STEEL TUBES ON FLOWING (16-25 M-SEC) DEAERATED H-SUB2 O SUBCOOLED (DELTA T SUBSC) 15-85 DEGREES BELOW THE SATN. TEMP.; THE PRESSURE OF Q SUBCR VARIED FROM 0.5 TO 3.0 KG-CM PRIME2. EXPTL. DETD. Q SUBCR IN W-M PRIME2 AGREED TO PLUS OR MINUS 20PERCENT WITH RESULTS CALCD. FROM THE A. P. ORNATSKII (1960) Q SUBCR EQUATION. AGREEMENT BETTER THAN PLUS OR MINUS 10PERCENT WAS OBSD. WITH LITERATURE DATA IN WHICH THE Q SUBCR APPROXIMATELY EQUAL TO F(DELTA T) AT THE LOW PRESSURES WAS SIMILAR TO 10 KG-CM PRIME2. THE Q SUBCR REMAINED UNAFFECTED AT DELTA T IS SMALLER THAN 30 DEGREES. FACILITY: INST. TEOR. EKSP. FIZ., MOSCOW, USSR.

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Dmitriyev, A. Ya.; Denisov, V. P.; Timonin, A. A.; Terpilov, A. A.; Zhelyabin,
B. I.; Grishin, E. Ya.; Kirsanov, A. V.; Polyakov, V. A.; Leonidov, E. A.

From Space Vehicles to Orbital Stations (Ot kosmicheskikh ko-
 rabley k orbital'nyy stantsiyam) Moscow. Mashinostroyeniye.

TABLE OF CONTENTS:

Preface		3
Chapter I	The Main Stages of Soviet Astronautics	5
II	The Program of Piloted Vehicles "Vostok and Voskhod"	11
III	The Program of Piloted Vehicles "Soyuz"	19
IV	Main Flight Stages of the Vehicles "Soyuz"	43
V	The World's First Experimental Cosmic Station and Prospects of Orbital Flights	60

The book tells of the Soviet program for piloted flights and examines the
 main stages of development of Soviet Astronautics. Shown are prospects for
 the development of orbital stations.

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12.

1/2 035 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--NEW PHASE TRANSITION IN TRIGLYCINE SELENATE AT HIGH PRESSURES -U-

AUTHOR--(031)-MYLOV, V.P., CHURAGULOV, B.R., LECNIDOV, G.G.

CCOUNTRY OF INFO--USSR

SOURCE--FIZ. TVERO. TELA 1970. 12(4), 1288-9

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ORGANOSELENIUM COMPOUND, ORGANIC CRYSTAL, HIGH PRESSURE,
THERMAL EFFECT, PHASE TRANSITION, THERMOGRAM, GLYCINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3005/0011

STEP NO--UR/01BL/70/012/004/1288/1289

CIRC ACCESSION NO--AP0132311

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UNCLASSIFIED

PROCESSING DATE--20NOV70

2/2 035
CIRC ACCESSION NO--AP0132311
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. IN TRIGLYCINE SELENATE CRYSTAL (NH₄ SUB2 CH SUB2 COOH) SUB3.H SUB2 SED SUB4 THE 1ST ORDER PHASE TRANSITION WAS INVESTIGATED AT HIGH PRESSURE BY THE DTA METHOD. IT FOLLOWS FROM THERMOGRAMS OBTAINED AT ROOM TEMP. THAT IN ADDN. TO THE KNOWN TRANSITION AT 6.5 KILOBARS THERE IS A NEW PHASE TRANSITION AT 13.6 KILOBARS. BOTH TRANSITIONS HAVE THE SAME SIGNS OF THEIR THERMAL EFFECTS. THE NEW PHASE TRANSITION IS REVERSIBLE. IT IS CHARACTERIZED BY HYSTERESIS IN PRESSURE OF APPROX. 1.5-2 KILOBARS. FACILITY: INST. FIZ. VYS. DAVLENI, USSR.

UNCLASSIFIED

A. LEONOV

Acc. Nr.: AP0050224

Ref. Code: US0000

PRIMARY SOURCE: FBIS Daily Report, Soviet Union, 5 April 1970, Vol III,
Nr 68, pp D 9 - D 10

USSR

COSMONAUT TRAINING CENTER MARKS 10TH ANNIVERSARY

Moscow TASS International Service in English 1522 GMT 7 Apr 70 L

[Text] Moscow April 7. TASS--During his one-year training for a space flight the Soviet Cosmonaut Alexei Leonov covered about a thousand kilometres on bicycle, made two hundred cross-country races and covered three hundred kilometres on skis, whereas Herman Titov boarded different planes 800 times and spent hundreds of hours in flight.

These figures were cited by Colonel General of the Air Force Nikolai Kamanin in his feature story about the Soviet Space Training Centre, which will be ten years old this month. The feature story was published in the magazine "AVIATSIYA AND KOSMONAVTIKA".

A group of socialists of which General Kamanin was one of the leaders was set up to start this centre by the decision of the CCPS Central Committee and government. In

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1969 Kamanin was summoned from Central Asia by Konstantin Vershinin, commander-in-chief of the air force, and was entrusted with the training and selecting of cosmonauts. "Our main task was to organize a cosmonauts' detachment and set up a space training centre," Kamanin writes.

At present this centre, known as "Zvyozdny Gorodok" has grown into a real town with all modern conveniences, but at the time it was an ordinary forest in Moscow region, far from noisy thoroughfares, factories and busy cities.

In the midst of a pine forest the walls of a hotel, a canteen, headquarters and academic building began growing up day by day.

Among the experienced specialists who began pioneering work to set up the space training centre, Kamanin mentions Major General of Aviation Leonid Goregilyud, who downed about two dozen Hitler planes during the war, and Colonel Boris Arishev, a navigator.

It was clear that the man who will lead the group of future spacemen will have to be a chief and a teacher and at the same time a daring experimentalist. Colonel Yevgeniy Karpov, connoisseur of aviation medicine, became the chief of the centre. "The cosmonauts' deep-felt gratitude to the first chief of the centre is an appreciation of his great efforts to establish and mould this collective body," Kamanin says.

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The future cosmonauts Gagarin, Titov, Nikolayev, Popovich and other fighter-pilots came to Zvyozdny in March 1960. They were to master the rudiments of rocketry and space engineering, the design of the spacecraft Vostok, astronomy, geophysics and space medicine.

There was a lot of parachute jumping training at the first stage. The training was directed by Lieutenant Colonel Nikolai Nikitin, the world record holder, who died later during an experimental jump.

Flight training was directed by well known test pilots, specifically Anatoly Starikov. A special laboratory was set up aboard a TU-104 plane for training for flights in conditions of weightlessness.

"Step by step our cosmonauts climbed higher and higher to earn the right to pilot spaceships," General Kamanin writes.

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Acc. Nr.: AP0050235

Ref. Code: US0000

PRIMARY SOURCE: FBIS Daily Report, Soviet Union, 16 March 1970, Vol III,
Nr 51, p D 1

USSR

LEONOV INTERVIEWED ON FUTURE OF SPACE PROGRAM

Moscow TASS International Service in English 1020 GMT 14 Mar 70

[Text] Moscow March 14, TASS--"Man has big opportunities in space", said Soviet cosmonaut Alexei Leonov. He believes that the words of Konstantin Tsiolkovsky (1857-1935), founder of cosmonautics, that the "man will inhabit all the near-terrestrial space" will come true.

The fifth anniversary when Leonov was the first to walk from the "Voskhod-2" ship into the open space falls due on March 18.

Leonov said in a TASS interview that the creation of permanent orbital scientific stations will become one of the first indications of man's inhabiting the near-terrestrial space. Functions will be rationally divided between man and automation in the

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assembly of such stations, in his opinion. The assembly can be carried out automatically. But, it is doubtful that it would be expedient to provide small parts and individual structure with complex fitting devices. Man will be required in this case. And, probably, it will be impossible to avoid welding of metals in space.

The cosmonaut is convinced that man will have to walk into space to inspect or repair instruments installed on the surface of the laboratory. It is also more expedient to film the universe or the earth from the open space rather than through the glass of a port hole. It is clear that the range of man's activity directly in the open space will grow with the expansion of scientific and practical tasks, Leonov said.

The cosmonaut has assessed as number one the problem of development of space suit design. Only reliable, light, and convenient for life and work spacesuits will enable cosmonauts to work efficiently in the rigorous space medium, he said.

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But the most necessary is the experience and acquiring of habits. The group walkout into space by Yevgeny Khruunov and Alexei Yeliseyev (October 1969) and the big scope of work accomplished by them, have considerably extended knowledge in this field.

Leonov emphasized that "habitation" of the near terrestrial space is not a remote future as the science on space and the space technique are developing extremely swiftly.

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19810154

1/3 031 UNCLASSIFIED PROCESSING DATE--090CI70
TITLE--FLIGHT CENTER PERSONNEL INTERVIEW -U-
AUTHOR--LECNOV, A.
COUNTRY OF INFO--USSR
SOURCE--FBIS DAILY REPORT, SOVIET UNION, 5 JUNE 1970, VOL III, NR 109, P.
D 2-3
DATE PUBLISHED--05JUN70
SUBJECT AREAS--SPACE TECHNOLOGY
TOPIC TAGS--MANNED SPACECRAFT, FLIGHT CREW, AUTOMATIC CONTROL FACILITY,
SPACECRAFT CONTROL FACILITY/(U)SOYUZ 9 MANNED SPACECRAFT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1990/1642 STEP NO--US/0000/TO/008/109/0002/0003
CIRC ACCESSION NO--AP0109646
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--09OCT70

2/3 031

CIRC ACCESSION NO--AP0109646

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MOSCOW JUN 4 TASS ALEXEI LEONOV, THE FIRST MAN TO HAVE MADE A SPACE WALK, MADE TODAY A TELEVISED REPORTAGE FROM THE SOVIET SPACEFLIGHT CONTROL CENTER; IT RECEIVES AND PROCESSES DATA FROM SOYUZ 9 WHICH WAS PUT INTO AN ORBIT AROUND THE EARTH ON JUNE 1. LEONOV TOLD IN DETAIL ABOUT THE RECEIVING AND TRANSMITTING COMPLEXES OF THE CENTER WHICH HAS POWERFUL COMPUTER EQUIPMENT. THE OPERATOR SHOWED ONE OF ITS HIGHAERIALS. "BUT WHAT IS MOST IMPORTANT HERE ARE PEOPLE, GOOD, EFFICIENT, AND ABLE SPECIALISTS." ALL FUNCTIONS AT THE CENTER ARE DISTRIBUTED BETWEEN SPECIALISED GROUPS. THUS, THE CONTROL GROUP WHICH ALSO INCLUDES COSMONAUTS PREPARES COMMANDS TO BE SENT TO THE SPACESHIP. THE ANALYSIS GROUP IS STUDYING TELEMETERED DATA ON THE PERFORMANCE OF THE SHIP'S SYSTEMS AND COMPARES THEM WITH THE DATA OF THE PVIOUS FLIGHTS. THERE IS A MEDICAL GROUP WHICH KEEPS THE HEALTH OF ANDRIYAN NIKOLAYEV AND VITALI SEVASTYANOV, UNDER CONSTANT TELEMETRIC CONTROL. THE CHIEF OF TODAY'S SHIFT, COSMONAUT VALERI BYKOVSKY, AND OPERATOR ON DUTY, VIKTOR GORBATKO, ALSO SPARED A FEW MINUTES FOR THE REPORTAGE. GORBATKO STRESSED THAT EVERYTHING IS IN ORDER ABOARD SOYUZ 9 AND THAT ALL ITS SYSTEMS ARE FUNCTIONING NORMALLY AND COMMUNICATION WITH THE SHIP IS VERY STABLE. HE REPORTED THAT DURING THE LAST COMMUNICATION SESSION HE TRANSMITTED TO NIKOLAYEV A TELEGRAM FROM YAKUSLAVL, THE BIRTH PLACE OF HIS WIFE VALENTINA TERESHKOVA WHO RUNS FOR THE S VIET PARLIAMENT. TODAY SHE HAD A MEETING WITH HER ELECTORS. "THERE IS A MEDICINE CHEST ABOARD THE SPACECRAFT.

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PROCESSING DATE--09OCT70

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CIRC ACCESSION NO--AP0109646

ABSTRACT/EXTRACT--BUT THE COSMONAUTS NEVER NEEDED IT AND I THINK WE WON'T HAVE TO HELP THEM WITH ADVICE," SAID A SPOKESMAN OF THE MEDICAL GROUP. THE TELEMETRIC DATA CONFIRMED THE COSMONAUTS' WORDS THAT THEY FEEL FINE. THE CREW MEMBERS HAVE ALREADY CARRIED OUT THREE SETS OF SPECIAL EXERCISES AS A TONIC. THEIR HEART BEAT, RESPIRATION RATE AND ARTERIAL PRESSURE ARE EXCELLENT.

UNCLASSIFIED

ANNOTATION

A. A. Leonov, and V. I. Lebedev. Psychological Character-
istics of the Activity of Cosmonauts. 1971.

In this volume A. A. Leonov, Pilot-Cosmonaut of the USSR,
and V. I. Lebedev, Candidate of Medical Sciences, discuss the
role of the cosmonaut in the man-spacecraft system, the
of crew teamwork in controlling multiple spacecraft, and the
psychological aspects of the preparation of cosmonauts as
operators. ~~From the chapter on the cosmonaut's conditions~~
and the associated psychophysiological mechanisms of space and
time perception away from the earth as man goes into outer space.
The influence of weightlessness, extended isolation in cramped
quarters, emotional stress and other space flight factors on
man's perception of time is explained. An analysis is made of
man's motor activity under various conditions. The gains
possible from integrating man and machine and training the
cosmonaut for orientation during long space flights and also
from organizing work and rest periods during interplanetary
space flights are pointed out.

The book is intended for psychologists, philosophers,
biologists, doctors, cosmonauts, pilots, and other specialists
interested and involved in working out the problems of aviation
and space psychology.

There are seven tables, 26 figures, and 198 references.

Responsible editor — Professor A. N. Leont'yev.

1/4 027 UNCLASSIFIED
TITLE--FIRST EMERGENCE OF MAN INTO SPACE, LEONOV DISCUSSES FIRST EMERGENCE
INTG SPACE -U-
AUTHOR--LEONOV, A.A.
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, AVIATSIYA I KOSMONAVTIKA, NO 3, 1970, PP 30-32
DATE PUBLISHED-----7C
SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES, BIOLOGICAL AND MEDICAL
SCIENCES
TOPIC TAGS--EXTRAVEHICULAR ACTIVITY, COSMONAUT, SPACE SUIT, EXTRAVEHICULAR
LIFE SUPPORT SYSTEM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/0556 STEP NO--UR/0209/10/000/003/0030/0032
CIRC ACCESSION NO--AP0132741
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--20NOV70

2/4 027

CIRC ACCESSION NO--AP0132741

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE FOLLOWING ARE EXCERPTS OF A CORRESPONDENT'S INTERVIEW WITH COLONEL ALEKSEY LEONOV, FIRST COSMONAUT TO EMERGE INTO OPEN SPACE: Q. WHAT WAS STRESSED DURING TRAINING? A. I WAS TO EMERGE INTO SPACE IN A SPECIALLY DEVELOPED SUIT UNDER AN EXCESS PRESSURE OF 0.4 ATM WITH A SELF CONTAINED LIFE SUPPORT SYSTEM. IT IS NOT TOO EASY TO WORK IN SUCH A SUIT. FOR EXAMPLE, AN EFFORT OF 25 KG IS REQUIRED FOR CLENCHING THE HAND IN A GLOVE. THEREFORE, I AND MY STAFF IN YE. KHRUNOV DEVOTED MUCH ATTENTION TO PHYSICAL TRAINING AND SPORTS. IN SUMMER I NOT ONLY EXERCISED WITH GYM EQUIPMENT, BUT ALSO RAN CROSS COUNTRY FOR 7 OR 8 KM; IN WINTER I COVERED 10 KM ON SKIS. THE VESTIBULAR APPARATUS ALSO HAD TO BE STRENGTHENED. PARACHUTE JUMPS HAD HELPED US TO OVERCOME THE PSYCHOLOGICAL BARRIER. DURING THE FLIGHT EMERGENCE CAUSED INTEREST RATHER THAN FEAR. D. WHY WAS AN AIR LOCK USED DURING EMERGENCE RATHER THAN DEPRESSURIZING THE SHIP? A. USE OF AN AIR LOCK IS MORE COMPLEX, BUT IT IS SAFER; EMERGENCE FROM A DEPRESSURIZED CABIN IS LESS COMPLEX, BUT MORE DANGEROUS. IN THE LATTER CASE ALL CREW MEMBERS AND EQUIPMENT ARE EXPOSED TO A VACUUM. AIRLOCKS WILL BE USED IN THE ASSEMBLY OF LARGE ORBITAL STATIONS, AND IN PERFORMING MANY MAJOR AND MINOR TASKS IN OPEN SPACE. Q. PRIOR TO YOUR FLIGHT AMERICAN SPECIALISTS PLANNED ON A SLOW AND GRADUAL EMERGENCE BUT CHANGED THEIR PROGRAM AFTER YOUR EMERGENCE. A. AFTER OUR EXPERIMENT MANY THINGS BECAME CLEAR AND THE AMERICANS NATURALLY DECIDED THAT THEY COULD ACT MORE BOLDLY. Q. DID ANYTHING COME AS A SURPRISE DURING YOUR EMERGENCE?

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PROCESSING DATE--20NOV70

3/4 027

CIRC ACCESSION NO--AP0132741

ABSTRACT/EXTRACT--A. IF YOU VIEW THE FILMS YOU WILL NOTE A MOMENT WHEN THE EARTH GRADUALLY SLIPS OUT OF THE FIELD OF VIEW. IN ACTUALITY, THE EARTH REMAINED WHERE IT WAS SUPPOSED TO BE, BUT THE SHIP WAS ROTATING. THIS WAS A SURPRISE. PRIOR TO THE FLIGHT HE ASSUMED THAT MOVEMENT OUTSIDE THE SHIP MIGHT CAUSE SOME CHANGE IN ITS ORIENTATION, BUT WE DID NOT BELIEVE IT WOULD BE ON SUCH A SCALE. Q. WHAT STICKS IN YOUR MEMORY MOST ABOUT YOUR EMERGENCE? A. THE APPEARANCE OF THE EARTH. IT WAS UNFORGETTABLE. I EMERGED OVER THE BLACK SEA AT AN ALTITUDE OF ABOUT 450 KM. I COULD VIEW THE ENTIRE SEA FROM ODESSA TO BATUMI, FROM YALTA TO SINCOP, THE CRIMEAN PENINSULA AND PART OF THE CAUCASUS. IT WAS AS IF I WAS BENDING OVER A LARGE MAP. Q. WHAT WOULD YOU CHANGE IF YOU HAD TO DO IT AGAIN? A. I WOULD NOT INTRODUCE ANY CHANGES INTO THE TRAINING; IT WAS CORRECT. I WOULD ALSO LEAVE THE AIRLOCK UNCHANGED. HOWEVER, THE EXIT HATCH SHOULD BE BROADER BECAUSE IT WAS DIFFICULT TO RETURN FROM SPACE WITH THE MOVIE CAMERA IN MY HANDS. I HAD TO MAKE SEVERAL TRIES. Q. WILL MANY PEOPLE WORK IN OPEN SPACE? A. MANY PEOPLE WILL HAVE TO WORK IN OPEN SPACE IN ASSEMBLING ORBITAL STATIONS FROM LARGE UNITS, WELDING PARTS, ETC. SHIP EMERGENCE WILL BE NECESSARY FOR REPAIRS AND TECHNICAL SERVICING OF THE SHIP AND OTHER EQUIPMENT, RESCUING COSMONAUTS, ETC. Q. WHAT DOES MAN REQUIRE FOR WORK OUTSIDE A SHIP? A. IT IS MOST IMPORTANT TO HAVE A RELIABLE SPACESUIT WITH A LIFE SUPPORT SYSTEM. THIS WOULD BE ADEQUATE FOR A SPACE WALK, BUT FOR WORK HE REQUIRES MEANS OF MOVEMENT, ORIENTATION AND REMAINING FIXED IN HIS WORKING PLACE; TOOLS ARE ALSO REQUIRED.

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UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132741

ABSTRACT/EXTRACT--WRENCHES, SCREWDRIERS AND HAMMERS MUST ALSO DIFFER
SUBSTANTIALLY FROM THOSE USED ON EARTH. Q: WHAT EVENTS HAVE OCCURRED
IN YOUR LIFE SINCE YOUR EMERGENCE? A: I GRADUATED FROM THE AIR
ENGINEERING ACADEMY AND BECAME A MEMBER OF THE UNION OF ARTISTS USSR. I
WAS ELECTED A MEMBER OF THE CENTRAL COMMITTEE OF THE YOUNG COMMUNISTS
AND VICE PRESIDENT OF THE SOCIETY OF USSR CZECHOSLOVAKIAN FRIENDSHIP. I
HAVE TRAVELED THROUGH BULGARIA, HUNGARY, EAST GERMANY AND
CZECHOSLOVAKIA, A NUMBER OF COUNTRIES IN WESTERN EUROPE, LATIN AMERICA,
CYPRUS AND SYRIA.

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TITLE--LIFE AND WORK IN OPEN SPACE LECNOV DISCUSSES WORK IN OPEN SPACE -U-

AUTHOR--LECNOV, A.A. L

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ABSTRACT/EXTRACT--(U) GP-0-

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ABSTRACT. FLIER COSMONAUT ALEKSEY A. LEOV
WAS INTERVIEWED BY TASS CORRESPONDENT A. ROMANOV ON THE OCCASION OF THE
FIFTH ANNIVERSARY OF HIS WALK IN SPACE, 18 MARCH 1965. HIS COMMENTS AT
THE INTERVIEW ARE PRESENTED HERE ALMOST IN THEIR ENTIRETY. THERE ARE
GREAT PROSPECTS FOR MAN IN SPACE. WE RECALL TSIOLKOVSKIY'S WORDS, MAN
WILL POPULATE ALL CIRCUMTERRESTRIAL SPACE. ALL THAT WORLD SCIENCE IS
NOW DOING IN THE EXPLORATION AND CONQUEST OF SPACE, THESE ARE IMPORTANT
AND VERY PROMISING STEPS IN FULFILLING TSIOLKOVSKIY'S IDEA. THE
TREMENDOUS TASKS FACING MAN AT PRESENT, AS HIS GRADUAL ACCLIMATIZATION
TO SPACE IS PROCEEDING, CAN BE WELL IMAGINED. ONE OF THE MOST
IMPORTANT SIGNS OF THIS IS THE CREATION OF PERMANENT ORBITAL SCIENTIFIC
STATIONS IN EARTH ORBIT. MUCH HAS BEEN SAID AND WRITTEN ABOUT THESE,
ESPECIALLY SINCE JANUARY OF LAST YEAR WHEN THE SOVIET UNION CREATED THE
FIRST ORBITAL EXPERIMENTAL STATION. LET US AGAIN TURN TO THE QUESTION
OF SCIENTIFIC STATIONS, OR RATHER TO THE TASK OF BUILDING THEM IN AN
ORBIT AROUND THE EARTH OR IN ANY OTHER ORBIT. IN THEIR ASSEMBLY, OF
COURSE, THE FUNCTIONS BETWEEN MAN AND AUTOMATIC DEVICES WILL RATIONALLY
BE DIVIDED. THE PRINCIPAL PARTS OF THE STATION WILL BE DELIVERED TO
THE ASSEMBLY ZONE BY BOOSTER ROCKETS. ASSEMBLY IS POSSIBLE
AUTOMATICALLY OR WITH THE USE OF MEN. BUT FOR SMALL PARTS AND SEPARATE
STRUCTURES OF THE STATION IT WILL HARDLY BE WORTHWHILE TO PROVIDE
JOINING DEVICES WITH THEIR NECESSARY RATHER COMPLEX MECHANISMS. A
COSMONAUT WILL PERFORM THE SIMPLEST ASSEMBLY WORK, AND IN SOME CASES,
THAT WHICH REQUIRES THE GREATEST PRECISION.

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ABSTRACT/EXTRACT--BOLTS, NUTS, RIVETS AND OTHER METHODS OF JOINING STRUCTURES WILL WITHOUT QUESTION BE USEFUL IN SPACE. AS TO THE WELDING OF METALS, IT WILL BE IMPOSSIBLE TO AVOID ITS USE. THE COSMONAUT'S DUTIES ARE NOT ENDED WITH THE COMPLETION OF THE STATION. HE MUST ALSO BE A FIGGER, ASTRONOMER, PHYSICIST, CHEMIST OR BIOLOGIST. A MAN WHO IS A MEMBER OF THE CREW ON SUCH STATIONS MUST LEAVE HIS HOME AND GO OUT, FOR EXAMPLE, TO INSPECT OR REMOVE INSTRUMENTS MOUNTED ON THE SPACE LABORATORY SURFACE, OR TO REPLACE ONE INSTRUMENT WITH ANOTHER. THERE IS NO QUESTION THAT PHOTOGRAPHY OF THE UNIVERSE OR THE EARTH IS BETTER DONE FROM OPEN SPACE RATHER THAN FROM THE CABIN OR LABORATORY OF A STATION THROUGH THEIR GLASS PORTS. STILL OTHER SIMILAR EXAMPLES ARE THE REPAIR OF SOME SPACE OBJECT OR ITS TECHNICAL INSPECTION. ANOTHER THING IS ALSO CLEAR. SIMULTANEOUSLY WITH THE BORADENING OF SCIENTIFIC AND PRACTICAL TASKS RESOLVED IN SPACE THE RANGE OF MAN'S ACTIVITIES ON BOARD SPACE SHIPS AND STATIONS AS WELL AS DIRECTLY IN OPEN SPACE WILL INCREASE PROPORTIONATELY. YOU ARE FAMILIAR WITH THE SERIES OF PICTURES DRAWN BY MYSELF AND ANDREY SOKOLOV, THE ARTIST, IN WHICH WE TRIED TO ARTISTICALLY DEPICT THE ACTUAL SCALES AND NATURE OF WORK WHICH WILL BE DONE IN OPEN SPACE AND ON THE SURFACES OF ORBITAL STATIONS AND CELESTIAL BODIES. I ALSO FORESEE SOME GREAT DIFFICULTIES. MY WALK IN MARCH OF 1965 ALSO CONVINCED ME OF THIS. ONE THING CANNOT BE IGNORED: MAN WILL ALWAYS BE FORCED TO WORK IN SPACE UNDER CONSTANTLY ACTING UNFAVORABLE CONDITIONS: WEIGHTLESSNESS, RADIATION CONDITIONS, SHARP CHANGES IN TEMPERATURES, AND UNUSUAL SOLAR ILLUMINATION.

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ABSTRACT/EXTRACT--A SMALL EXAMPLE OF THIS WAS WHEN I WAS WORKING WITH THE CAMERA AND I UNFORTUNATELY TURNED TOWARD THE SUN. AND THE RESULT? THE RAYS FELL ON THE LENS AND SERIOUSLY HARMED THE PICTURES. THESE UNUSUAL CONDITIONS DEMANDED THE DEVELOPMENT OF SPACESUITS. THEY PROTECT MAN FROM THE HARMFUL ACTION OF THE SPACE MEDIUM, BUT THEY ARE NOT THE BEST OF WORKING CLOTHES. THE ATTEMPT TO PERFORM THE SIMPLEST OPERATION IN SPACE, REMOVING THE MOTION PICTURE CAMERA FROM THE SURFACE OF VOSKHOD-2, CAUSED ME TO EXPEND MUCH MORE ENERGY THAN WOULD BE NEEDED ON EARTH. THE REASON? IT WAS NECESSARY TO OVERCOME A CERTAIN RIGIDITY OF THE SUIT WHICH WAS SUBJECTED TO A SPECIFIC INTERNAL PRESSURE. THUS, A SPACE SUITED MAN TIRES MORE QUICKLY. THE NEED FOR ALTERNATE WORK REST PERIODS IS EVIDENT FROM THIS. THE DEVELOPMENT OF A PRODUCTIVE WORKING REGIME IS ONE OF THE NEW PROBLEMS CONFRONTING SCIENCE. SPACESUIT DESIGN REMAINS PROBLEM NUMBER ONE. ONLY THE AVAILABILITY OF RELIABLE, LIGHT SPACESUITS, WHICH ARE COMFORTABLE TO WEAR AND WORK IN, WILL PERMIT COSMONAUTS TO LABOR PRODUCTIVELY IN THE UNUSUALLY SEVERE MEDIUM OF SPACE. STILL ANOTHER PROBLEM FACING THE COSMONAUT IN SPACE IS THE ABILITY TO PERCEIVE AND ESTIMATE TIME AND DISTANCE. THIS REQUIRES THE DEVELOPMENT OF A SPECIAL METHODOLOGY. WITHOUT A KNOWLEDGE OF THIS IT IS SCARCELY POSSIBLE TO SPEAK SERIOUSLY OF THE PRODUCTIVE ACTIVITY OF A MAN IN CIRCUMTERRESTRIAL SPACE. AN ATTEMPT TO ANSWER THESE QUESTIONS WAS MADE TOGETHER WITH DOCTOR VLADIMIR LEBEDEV IN A BOOK WHICH WAS PUBLISHED BY THE NAUKA PUBLISHING HOUSE. BUT THE MOST NECESSARY FACTOR, AS ALWAYS, IS EXPERIENCE AND PRACTICE.

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ABSTRACT/EXTRACT--THE GROUP EMERGENCE BY YEVGENIY KHRUNOV AND ALEKSEY YELISEYEV, AND THE GREAT AMOUNT OF WORK THEY CARRIED OUT, THEY WERE IN OPEN SPACE ABOUT AN HOUR, CONSIDERABLY BROADENED OUR KNOWLEDGE IN THE AREA. I HAVE SPOKEN IN DETAIL ON THE NEED FOR MAN TO WORK A GREAT DEAL AND WORK PRODUCTIVELY IN SPACE. THIS MEANS THAT HE WILL NEED THE MOST VARIED INSTRUMENTS. I THINK THAT SEMIAUTOMATIC DEVICES, PNEUMATIC HAMMERS, SCREWDRIVERS, WRENCHES AND MANY OTHER TOOLS WILL BE PART OF THE COSMONAUT'S EQUIPMENT. CIRCUMSTANCES WILL UNDOUBTEDLY DICTATE THE NEED FOR NEW INSTRUMENTS AS WELL. IT IS STILL NECESSARY TO BUILD A MINITRANSPORT, OR CART, WHICH WOULD ENABLE A COSMONAUT TO TRAVEL SHORT DISTANCES EASILY. ALL THAT I HAVE SPOKEN OF LIES IN THE NEAR FUTURE. THE SCIENCE OF SPACE AND SPACE TECHNOLOGY ARE DEVELOPING WITH UNUSUAL RAPIDITY. THE EARTH AND SPACE SCIENCES ARE MUTUALLY AFFECTED AND ENRICHED IN THE PROCESS. IN OTHER WORDS, MUCH THAT EXISTS ON EARTH IS BEING AND WILL BE INTRODUCED INTO SPACE. THERE WILL BE SOCIALISTIC COMPETITION FOR THE EARLY OPERATION OF SPACE OBJECTS, THE STRUGGLE FOR ECONOMY OF MONEY AND MATERIALS, THE SEARCH FOR RESERVES, MEETINGS WITH CRITICS AND SELF CRITICS, AND THE ARRIVAL OF ACTORS ON ORBITAL STATIONS AS IS NOW THE PRACTICE IN ANTARCTICA. ALL THIS WILL COME ABOUT. IN TIME, SPACE WILL BE FILLED WITH AN INFINITE NUMBER OF ARTIFICIAL OASES RESEMBLING OUR MOTHER, THE PLANET EARTH.

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ABSTRACT. THERE ARE GREAT PROSPECTS FOR MAN LIVING AND WORKING IN OPEN SPACE. ALL THIS IS VITAL IF SCIENTIFIC STATIONS ARE TO BE CREATED IN ORBIT ABOUT THE EARTH OR ANY OTHER PLANET. NATURALLY, THERE WILL BE A RATIONAL DIVISION OF LABOR BETWEEN MAN AND AUTOMATIC APPARATUS. ROCKETS WILL CARRY THE PRINCIPAL COMPONENTS OF STATIONS INTO ORBIT. ASSEMBLY CAN BE ACCOMPLISHED AUTOMATICALLY OR WITH THE PARTICIPATION OF MAN. HOWEVER, SMALL PARTS CAN SCARCELY BE ASSEMBLED BY DOCKING PROCEDURES, NOR CAN RATHER COMPLEX MECHANISMS. THE SIMPLEST ASSEMBLY WORK AND POSSIBLY THE MOST PRECISE WORK MUST BE DONE BY A COSMONAUT. BOLTS AND NUTS, RIVETS AND OTHER MEANS FOR THE ATTACHMENT OF PARTS WILL UNDOUBTEDLY BE USEFUL IN SPACE. WELDING WILL PROBABLY BE INDISPENSABLE IN SPACE. SPACE STATION CREW MEMBERS WILL EMERGE FOR SUCH PURPOSES AS INSPECTING OR REPAIRING INSTRUMENTS MOUNTED ON THE SURFACE OF THE SPACE LABORATORY OR FOR REPLACING ONE INSTRUMENT BY ANOTHER. IT IS CERTAINLY PREFERABLE TO TAKE PHOTOGRAPHS OF EARTH OR SPACE FROM A VANTAGE POINT IN OPEN SPACE, RATHER THAN THROUGH A WINDOW. EMERGENCE IS ALSO REQUIRED FOR REPAIR OF A SPACE OBJECT, ITS TECHNICAL INSPECTION, PREVENTIVE REPAIRS, ETC. GREAT DIFFICULTIES WILL ARISE. MAN WILL ALWAYS BE WORKING IN SPACE UNDER CONDITIONS OF CONSTANTLY PREVAILING UNFAVORABLE FACTORS: WEIGHTLESSNESS, EXPOSURE TO RADIATION, GREAT TEMPERATURE DROPS AND UNUSUAL SOLAR ILLUMINATION. FOR EXAMPLE I (LEONOV) INADVERTENTLY TURNED TOWARD THE SUN WHILE TAKING PHOTOGRAPHS; THE SUN'S RAYS PENETRATED INTO THE LENS AND SERIOUSLY AFFECTED THE RESULTS.

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ABSTRACT/EXTRACT--IN ENDEAVORING TO PERFORM EVEN THE SIMPLEST OPERATIONS IN SPACE, REMOVING A CAMERA FROM THE SURFACE OF VOSKHOD-2, I SPENT MUCH MORE ENERGY THAN I WOULD HAVE SPENT ON EARTH ON THE SAME WORK. THIS WAS BECAUSE IT WAS NECESSARY TO OVERCOME SOME RIGIDITY OF THE PRESSURIZED SPACESUIT. THUS, MAN BECOMES FATIGUED SOONER IN A SPACESUIT. THIS MEANS THAT THERE MUST BE A PROPER ALTERNATION OF WORK AND REST. SPACESUIT DESIGN REMAINS THE MOST CRITICAL PROBLEM. ONLY THE AVAILABILITY OF RELIABLE, LIGHT AND COMFORTABLE SPACESUITS WILL ENABLE COSMONAUTS TO WORK PRODUCTIVELY UNDER THE UNUSUALLY SEVERE CONDITIONS OF SPACE. THE PERCEPTION OF TIME AND SPACE BY COSMONAUTS WHEN OUTSIDE A SHIP IS ALSO A CRITICAL PROBLEM. PRODUCTIVE WORK OUTSIDE A SHIP IS SCARCELY CONCEIVABLE WITHOUT THIS DUAL ORIENTATION. MINITRANSPORT IS ALSO REQUIRED SO THAT THE COSMONAUT CAN READILY OVERCOME SHORT DISTANCES.

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FROM: FBIS Daily Report, Soviet Union, 25 March 1970, Vol III, Nr 58,
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USSR MEN WILL WORK, LIVE IN SPACE IN NEAR FUTURE

Pravda SOVETSKAYA KIROIZIYA 18 Mar 70 p 2 L

[A.A. Leonov interview: "Life and Work in Open Space"]

[Text] "Man out in open space. Man out in open space," resounded the calm, assured voice of Voskhod-2 spaceship commander Pavel Belyayev over our planet. At that moment millions of people saw on their television screens the first step in space by cosmonaut Aleksey Leonov. This remarkable event took place on 18 March 1968-- 5 years ago.

Pilot-cosmonaut Aleksey Arkhipovich Leonov, answering the questions of TASS commentator A. Romanov, said:

Man has great prospects in space. The words of Konstantin Eduardovich Tsiolkovsky--man will occupy the whole of circumsolar space--will come true. All that world science is now doing in the research and conquest of space represents important

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and promising steps in implementing the ideas of Tsolkovskiy. I have a good idea of the enormous difficulties facing earthmen at the present stage, when gradual "making oneself at home" in circumterrestrial space is underway. One of the valuable signs of it will be creation of permanent orbital scientific stations around the earth. Much as been written and spoken about them, particularly after last January, when the Soviet Union created the first experimental orbital station.

But it is no longer a question of that. You ask what is the significance and what are the prospects for man's labor activities in open space, outside a spaceship or station. They are interesting, tempting, and extremely varied. Let us return once again to the problem of scientific stations or, to be more precise, to creating them in orbit around the earth or in any other orbit. In assembling them, of course, the functions will be rationally divided between man and automatic equipment. Carrier rockets will deliver the basic blocks of the station to the assembly region. It is possible to effect the assembly automatically or with man's participation. But small parts and individual components of the station can hardly be expediently equipped with docking installations, which are rather complex mechanisms. The simplest pieces of work and, in certain instances, the most precise or, as we say, the jewelry work, will be performed by a cosmonaut.

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So they create a station. But the cosmonaut's duties are not exhausted by this, regardless of what category he may belong to--assembler, astronomer, physicist, chemist, or biologist. A man who is a member of a crew will have to go out of the "house" onto the "street" in order, for example, to examine or repair the instruments installed on the surface of the space laboratory or to replace one instrument with another. It is indisputable that it is more expedient to film the earth or the universe from open space than from the cabin or laboratory of the space station through the glass of the portholes. One can cite several other similar examples: repair of a space project, technical examination for preventive ends, and so forth.

One thing is clear: simultaneously with the expansion of scientific and practical tasks which can be solved in space, the range of human activity both on board spaceships and stations and directly in open space is increasing too. You know the series of pictures that I took together with the artist Andrey Sokolov. We strove in them to predict with artistic representational means the real scale and nature of future work in open space to some extent.

I also predict great difficulties. I was convinced of this by my own "journey" in March 1965. One cannot forget the main things: man will have to contend with permanent unfavorable factors--weightlessness, radioactivity, sharp temperature drops, and unusual solar illumination.

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